

**CALIFORNIA OCCUPATIONAL HEALTH AND SAFETY SURVEILLANCE
OCCUPATIONAL HEALTH INDICATORS COMPONENT
ANNUAL REPORT: July 1, 2012 – June 30, 2013**

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The overall aims of the Occupational Health Indicators Component are to:

- Collect and analyze surveillance data for 20 Occupational Health Indicators (OHIs) and an Employment Demographics Profile annually;
- Identify and respond to emerging occupational health issues;
- Collaborate with in-state partners to obtain input to guide our program, gain support to further program goals, and have impact on public health and regulatory policies;
- Collaborate with other states, the Council of State and Territorial Epidemiologists (CSTE), and NIOSH on nationwide activities to reduce work-related injury and illness;
- Disseminate our surveillance data, investigation findings, public health recommendations, and educational materials through a variety of means; and
- Regularly evaluate the accomplishments and impact of our occupational health program, and develop recommendations for improving effectiveness.

MAJOR OUTPUTS

Surveillance and Investigations

1. ***Pilot surveillance of occupational coccidiomycosis*** (Valley Fever) - Using multiple data sources (occupational physician reports, workers' compensation claims, statewide coccidiomycosis surveillance system) and by partnering with the CDPH Infectious Diseases Branch (IDB) and local health departments, we identified several clusters of worker illnesses including at least 40 employees engaged in construction of two large solar energy generation facilities. Referred these sites for Cal/OSHA enforcement; conducted a joint field investigation with CDPH, Cal/OSHA, and the local health department; and developed interim recommendations to prevent future illness. Produced a "Preventing Work-Related Valley Fever" fact sheet. Participated in a NIOSH Health Hazard Evaluation site visit to address high rates of Valley Fever among employees at two state prisons.
2. ***Hantavirus exposures among employees*** at Yosemite National Park (YNP) – Responded to a National Park Service to assess the hantavirus prevention programs of the two major YNP employers. Partnered with CDPH laboratory and infectious disease personnel and CDC to conduct a survey of over 500 employees including a blood test for previous hantavirus exposure and questionnaire on hantavirus knowledge, exposures, and safety practices. Issued a report with key findings and prevention recommendations to both YNP employers and worker notification materials.
3. ***Methylene Chloride-based Paint Strippers*** – a field survey was conducted of hardware and paint stores to assess the types of products available and the advice given to customers inquiring about product hazards or safety precautions (see also under Presentations and Publications). Prepared a poster for stores on recommendations for purchasing non-toxic paint strippers, along with information for use of appropriate personal protective equipment. Identified over 4,000 stores (paint, hardware, home improvement) and purchased mailing labels from InfoUSA.

Data, Electronic and Web-based Communications (See www.cdph.ca.gov/programs/ohb)

1. Completed submission of 2009 and all available 2010 data for Employment Demographics Profile and 20 OHIs for publication on the CSTE website.

2. Created and disseminated to between 3,000 and 7,000 recipients nine issues of our electronic program newsletter **Occupational Health Watch** (e-OHW). The October 2012 issue "Investigating Hantavirus in Yosemite" arose from a collaborative effort with other infectious disease specialists at CDPH and federal agencies. The December 2012 issue "Preventing Worker Deaths from Methylene Chloride" introduced a new website topic page on safer alternatives to paint strippers containing methylene chloride and was a collaboration between multiple OHB programs. Improved the ease of sending e-OHW by transferring it to an email blast program that also allows for better tracking. Surveyed e-OHW recipients and analyzed metrics to inform redesign of newsletter appearance. Provided a presentation about e-OHW at the December 2012 State-Based Surveillance Partners meeting in Tampa, FL.
3. Completed a one-year OHB-wide communications planning process to increase effectiveness of development and dissemination of communications products. Conducted pilot projects to develop a policies and procedures manual, propose an ongoing mechanism for better coordination and use of resources, implement increased use of social media (through OHB Facebook and Twitter accounts), and develop other tools to assist staff working on communications efforts. Enhanced collaboration between health education and technical staff.
4. Publicized OHB fact sheets and other resources through the CDPH Twitter account, YouTube channel, and Facebook page.
5. Cleaned and expanded our electronic database of stakeholder contacts, with particular focus on construction stakeholders, health care professionals, trade associations, and unions.

Partnerships

1. Continued and expanded partnerships under which OHB staff provides mentoring to develop the future occupational health workforce (**CDC Epidemic Intelligence Service** program, **CDC Public Health Associate** program, **CSTE epidemiology fellowship** program, **University of California at San Francisco** occupational and preventive medicine fellowship program).
2. Created an article about the OHB digital stories project for the third annual edition of the popular publication, "Dying at Work in California," produced by the nonprofit group **WorkSafe**. The publication was released for Workers Memorial Day in April 2013, at a community event hosted by WorkSafe.
3. Partnered with **NIOSH NPPTL** on improving respiratory protection programs for health care workers nationwide through a project that involves adapting the California Respiratory Protection Program Toolkit into a co-branded NIOSH-OSHA educational material. Two OHB staff participate on an advisory group for a Joint Commission/NPPTL project to identify and produce a monograph on best practices in respiratory protection programs in health care.
4. Partnered with NIOSH by having staff serve on the Services and Health Care NORA sector committees.

Presentations and Publications

1. Beckman S et al. Evaluation of respiratory protection programs and practices in California hospitals during the 2009-2010 H1N1 influenza pandemic. *Am J Infect Control* (in press).
2. Fact sheet: Preventing Work-Related Coccidioidomycosis (Valley Fever), June 2013. Developed with input from employers in affected industries, local health departments, CDPH Infectious Diseases Branch, and NIOSH.
3. Blood Lead Levels in California Workers, 2008-2001; a new surveillance data report issued in May 2013 and disseminated through the June 2013 e-OHW.
4. Survey of Retail Stores: Methylene Chloride in Paint Strippers, October 2012; a report on a survey of hardware/paint stores on paint stripper products containing methylene chloride, safer alternatives, and safety advice given to customers. Several new educational materials were also developed to highlight the hazard of methylene chloride in paint strippers and aid in the selection of safer alternatives (e.g., Choosing Paint Removal Methods: Safety Considerations); they are available through a new website topic page. Presented findings on two FACE investigations and prevention materials to the California Industrial Hygiene Council, Fall 2012.

5. Development of a NIOSH-OSHA respiratory protection program toolkit and resources for hospital respirator program administrators. Presentation by Barbara Materna at NIOSH NPPTL health care stakeholder conference, June 2013, Atlanta, GA.
6. Cal/OSHA Aerosol Transmissible Disease standards: Roles and responsibilities of local health officers. Presentation by Barbara Materna to California Conference of Local Health Officers, December 2012 (Oakland, CA) and May 2013 (San Diego, CA).
7. CSTE annual meeting, June 2013, Pasadena, CA. OHB staff made numerous presentations on topics including: hantavirus survey of Yosemite employees, pilot occupational coccidioidomycosis surveillance and investigations, methylene chloride hazards and safer alternatives for paint strippers, musculoskeletal disorders among hotel housekeepers, illnesses related to pool chemicals, evaluation of occupational lead educational materials, and surveillance of hazardous materials incidents.

MAJOR OUTCOMES

Potential Outcomes

1. See above; nearly all items described above include dissemination of findings and public health prevention recommendations based on our work that, if used by others, would reduce workplace health and safety risks.

Intermediate Outcomes

1. Increased the reach of e-OHW by arranging for: 1) member distribution through trade associations such as the American Industrial Hygiene Association; and 2) reposting on labor, trade association, and public health blogs, listservs and publications. For example, the June 2013 edition about a lead surveillance report was reposted in the Leadnet listserv; the NY COSH e-newsletter; the Western Occupational and Environmental Medical Association e-newsletter; and the Pump Handle and the Robert Wood Johnson Foundation blogs.
2. Developed tailgate training guide on Preventing Work-Related Valley Fever among wildland firefighters which was distributed by CalFIRE to all crew leaders in the state.
3. The fact sheet Preventing Work-Related Coccidioidomycosis (Valley Fever), developed by OHB at the request of local health officers, is being further distributed to employers and workers in endemic counties through local health departments.

End Outcomes

Feedback from our stakeholders suggests that work conducted by OHB assists in reduction of workplace hazards and consequent injuries and diseases. These entities also carry out various interventions aimed at the same occupational health problem. When multiple parties come together at one point in time to respond jointly to a newly identified issue with a comprehensive, concerted prevention effort, we believe there is a measurable outcome with improvement in workplace health conditions.

**CALIFORNIA OCCUPATIONAL HEALTH AND SAFETY SURVEILLANCE
WORK-RELATED ASTHMA PREVENTION
ANNUAL REPORT
July 1, 2012 - June 30, 2013**

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The overall aims of the project are to identify, characterize and prevent work-related asthma (WRA) in California by:

- expanding case ascertainment using multiple data sources
- performing case-based field investigations and developing prevention strategies
- collaborating with local and state agencies
- disseminating results generated from project activities; and
- evaluating surveillance activities on an ongoing basis

MAJOR OUTPUTS

Data

1. We identified and confirmed 5,975 work-related asthma (WRA) cases using the NIOSH guidelines from January 1, 1993 through March 1, 2013. Of these, 3,106 confirmed cases (52%) lacked temporal information necessary for case classification. Of the 2,869 cases that were classified, 54% were new onset and 46% were work-aggravated. Among the 1,551 new onset cases, 69% were classified as new onset, unknown inducer; 16% were new onset, known inducer; and 15% were new onset RADS cases.
2. The overall rate of WRA was 2.1 cases/100,000 workers. The 5 industries with the highest rates were transit and ground passenger transportation (15.4/100,000); hospitals (12.1/100,000); museums, historic sites, and parks (7.5/100,000); utilities (7.2/100,000); and social assistance (6.6/100,000). The 5 occupations with the highest rates were firefighters (23.9/100,000); miscellaneous science technicians (15.3/100,000); medical assistants/healthcare support (11.2/100,000); telephone operators (10.1/100,000); and respiratory therapists (10.0/100,000).
3. The most common exposures identified were dust, unknown chemicals, cleaning chemicals, smoke, mold, indoor air pollutants, paint, and indoor air pollutants from building renovation. The most commonly reported known asthma-inducing exposures (AOEC 2013) were bleach, chlorine, latex, ammonia, formaldehyde, glutaraldehyde, sulfuric acid, and diisocyanates.
4. 1,649 previously unidentified cases were extracted from the DFR, WCIS, ED, and PDD data sets for 2010 and 2011 and are now being interviewed.

Press, workshops, conferences, and new partnerships

1. We produced an announcement about the release of a [fact sheet for workers on WRA and cleaning exposures](#) and distributed it to over 4,300 recipients through our electronic monthly newsletter (e-OHW). The announcement was picked up and re-published in several labor, advocacy, public health, and federal organization newsletters.
2. We collaborated with a variety of national partners in an alliance team and served as reviewers to develop a [“Green Cleaning, Sanitizing and Disinfection Toolkit for Early Care and Education,”](#) which was released in early summer 2013.
3. We participated on the organizing steering committee and moderated a session for an Asthma Research Summit, December, 2012.
4. We produced multiple tweets and Department Facebook postings to promote our eOHWS newsletter

announcements about the new surveillance report and to highlight work-related asthma on World Asthma Day and throughout World Asthma Month.

5. We produced and distributed an announcement about the release of [WRA findings](#) in the new California Asthma Surveillance Report and distributed it to over 4,300 recipients through our electronic monthly newsletter (e-OHW). The announcement was rebroadcast by multiple list serves and by labor, advocacy, regulatory, and public health organizations.

Presentations and Publications

1. Beckman et al. "Work-related asthma, injury, and illness due to swimming pool chemical exposure" at the Council of State and Territorial Epidemiologists Conference, Pasadena, CA, June 2013
2. "Schools that are Greener Make the Air Cleaner: Partnering with Custodians for Asthma Safe Schools" at the American Public Health Association annual meeting, San Francisco, CA., October 2012
3. A low literacy fact sheet for workers about work-related asthma and cleaning exposures was published in three languages in March 2013 ([English](#), [Spanish](#), [Chinese](#)).
4. Milet M, Lutzker L, Flattery J. "[Asthma in California: A Surveillance Report](#)". Richmond, CA: California Department of Public Health, Environmental Health investigations Branch, May 2013.
5. We participated in a webinar that was attended by 73 people to answer participant questions on the [work-related asthma chapter](#) in California's new asthma surveillance report, in May 2013.

MAJOR OUTCOMES

Potential Outcomes

1. Evaluation of hexavalent chromium levels produced by activated water device

At the request of the San Francisco Department of Public Health, and San Francisco Department of the Environment we collaborated with the California Department of Public Health Environmental Health Laboratory Branch and Drinking Water and Radiation Laboratory Branches to analyze levels of chromium and other metals produced by a device marketed as a sanitizer and cleaner and to better understand the process that led to the release of metals into the water. The device is no longer sold, but this information will be used to evaluate the potential for exposure to metals from existing devices and will inform the evaluation of other similar products.

2. Review of Alternatives Analysis Document for the City and County of San Francisco

At the request of the San Francisco Department of the Environment, we conducted a technical review of "Safer Products and Practices for Disinfecting and Sanitizing: An Alternatives Analysis," a document produced for them by the Green Purchasing Institute.

3. Childcare site investigations and exposure evaluation

As assistance to the San Francisco Department of Public Health's project to eliminate the use of bleach in childcare, we conducted worksite observations and air monitoring of disinfectant and sanitizer use in child care. We provided WRA data and technical support/consultation throughout the project and for the subsequent report, "[Bleach-free Disinfection and Sanitizing for Child Care.](#)"

Intermediate Outcomes

1. School Asthma-Safe Cleaning Guidelines

Our Cleaning for Asthma Safe Schools (CLASS) program continues to provide technical assistance to multiple school districts around the state. The CLASS program has nearly completed guidelines that walk a school district through the steps required to transition to safer cleaning products and practices.

We have trained personnel from multiple districts to adopt asthma-safer cleaning practices to protect staff and students. We are also finalizing a digital story to accompany the state-wide rollout of the guidelines once they are approved for release.

2. Third-party Certification for Safer Products

We provided input to the US EPA's Design for the Environment (DfE) program regarding the characterization of enzymes on their "[Safer Chemical Ingredients List](#)." Specifically, enzymes were listed as "of low concern" despite their ability to cause asthma. Based on our communications with DfE and information we provided to them, enzymes are now flagged as having some "hazard profile issues."

We also provided input to Green Seal opposing their exemption of enzymes from the asthmagen prohibition in several standards. In response, they added provisions for industrial hygiene monitoring and medical surveillance at the manufacturing site, and for labeling that explicitly states that enzymes can cause asthma. We also provided comments on Green Seal's proposed revisions to the criteria for volatile organic compound content for eight of their product standards.

3. Educational materials on asthma and cleaning

We have developed multiple educational materials in three different languages to try to prevent the use of cleaning products and methods that can cause or aggravate asthma. These educational materials have been downloaded 6,000 times in the last year, illustrating that our prevention messages and guidance are reaching a large number of constituents.

4. Homeless Shelter

We were contacted for technical assistance about reducing bleach exposures in a domestic violence shelter for women and children. We advised shelter staff on safer materials and methods for cleaning and sanitizing shelter spaces, and procured donated cleaning chemicals that are asthma-safe for staff and residents. We also assisted the shelter in generating a list of preferred cleaning products to post when asking for donations.

End Outcomes

Feedback from stakeholders suggests that findings, results, and recommendations have contributed to documented reductions in work-related morbidity and mortality related to asthma in the workplace. Our CLASS program has trained custodial staff to significantly reduce exposures to hazardous ingredients in cleaning chemicals in seven school districts and one charter school. These districts have followed our guidelines and made efforts to transition to asthma-safe cleaning methods and products. This has potentially reduced exposure to hundreds of teachers, custodians and staff members and over 143,000 students working and studying in the affected schools. In addition, our program has continued to collaborate with non-governmental advocates, local health departments, private industry, and other government agencies to develop and implement interventions and strategies for prevention targeted at the jobs, industries and exposures identified as high risk by our ongoing surveillance data. Our data and recommendations are also continually used by academia and other public health agencies to characterize the nature and extent of WRA and focus further prevention efforts in order to reduce WRA. We also continue to work toward policy changes, such as the addition of asthmagen criteria to third party certification programs, to decrease exposures, improve working conditions, and to reduce the burden of work-related asthma in California.

**CALIFORNIA OCCUPATIONAL HEALTH AND SAFETY SURVEILLANCE
WORK-RELATED INJURY FATALITIES
ANNUAL REPORT
July 1, 2012 - June 30, 2013**

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The overall aims of the California FACE (CA FACE) project are to identify, characterize, and prevent and occupational fatalities in California by:

- Maintaining and enhancing case ascertainment using multiple data sources;
- Performing case-based field investigations and developing prevention strategies;
- Collaborating with local and state agencies, and a wide range of other partners;
- Disseminating results generated from project activities; and
- Evaluating surveillance activities on an ongoing basis.

MAJOR OUTPUTS

Data

1. A total of 2,326 work-related injury fatalities in Los Angeles County have been identified since 1992.
2. The overall fatality rate is 2.9 per 100,000 workers. The rate of work-related fatalities among Hispanic workers (3.8/100,000) was 58% higher than for non-Hispanic workers (2.4/100,000). Among Hispanic workers, the top 5 occupations with the highest fatality rates are roofers (43.9/100,000); taxi drivers & chauffeurs (31.4/100,000), door-to-door sales & street vendors (29.9/100,000), security guards (23.8/100,000) and construction laborers (19.2/100,000). Among non-Hispanic workers, the top 5 occupations with the highest fatality rates are counter & rental clerks (45.9/100,000); taxi drivers & chauffeurs (21.7/100,000); police officers (16.5/100,000), driver/sales workers & truck drivers (15.9/100,000) and construction laborers (15.0/100,000).

Publications, Reports, Web-based Communications

1. A total of seven on-site investigation reports were published and posted to the CA FACE website:
 - 10CA009: Psychiatric technician dies from a patient assault at a forensic psychiatric facility
 - 11CA007: Laborer dies when he is crushed by an industrial washing machine
 - 11CA008: Two laborers die from hydrogen sulfide exposure in a confined space at an organic waste recycling facility
 - 11CA009: Paint maker dies from exposure to dichloromethane (methylene chloride) while cleaning a paint tank
 - 12CA001: Supervisor dies when he is decapitated by a rope that was pulled into a wood chipper
 - 12CA002: Maintenance worker dies from exposure to dichloromethane (methylene chloride) while stripping the floor of a baptismal font in a church
 - 12CA009: A day laborer dies when he is pinned between a loading dock and a backing truck
2. Two fact sheets, *A Day Laborer Dies When He Falls From a Scaffold* (October 2012), and *Un Jornalero Muere Al Caer de un Andamio!* (October 2012) were published and posted on the CA FACE website. These fact sheets were based on a fatality investigation involving a day laborer who died when he fell off a scaffold.
3. One peer-reviewed case study '*Fatalities Due to Dichloromethane in Paint Strippers: A Continuing Problem*' was published in the American Journal of Industrial Medicine.
4. Two digital stories (short safety videos) were produced highlighting findings and prevention recommendations from a fatality investigation involving a roofing supervisor who fell through a skylight. Both videos are available on the CDPH YouTube Channel <http://dld.bz/c2bjp> (English) and

<http://dld.bz/cJcGm> (Spanish), and the joint OSHA and NIOSH Fall Prevention Campaign <http://www.osha.gov/stopfalls/>.

5. A Spanish language digital story was produced highlighting findings and fall prevention recommendations from a fatality investigation involving a solar installer who fell from an apartment roof. The video is available on the CDPH YouTube Channel <http://dld.bz/cJd7J> and the joint OSHA and NIOSH Fall Prevention Campaign <http://www.osha.gov/stopfalls/>.
6. A feature article about the FACE digital stories was published in the 3rd annual report '*Dying at Work in California: The Hidden Stories Behind the Numbers*', produced by the nonprofit group WorkSafe. The publication was released for Worker's Memorial Day in April 2013, and was mailed to state legislators among many others.
7. Three e-mail blasts featuring FACE materials and prevention recommendations (*CA FACE Publishes 4 New Investigation Reports*, *CA FACE Publishes 3 New Investigation Reports*, and *Preventing Falls Through Skylights – A New 'Digital Story' for Workers Memorial Day*) were disseminated to over 2,000 employers and 5,000 OHB stakeholders.
8. 12,226 hard-copy English and Spanish fact sheets were disseminated to workers, employers, unions, labor centers, foreign consulates, community-based organizations, trade associations, state and local agencies and health care professionals.
9. An enhanced *Digital Stories Topic Page* was published featuring all six CA FACE digital stories, discussion questions, use in worker safety trainings, and how to download the videos.
10. CA FACE fact sheets, investigation reports, fatality alerts and digital stories were promoted widely using bilingual social media including CDPH and NIOSH FACE Twitter, YouTube, and Facebook.

Publications, Presentations and Awards

1. MacIsaac, J., Harrison, R., Krishnaswami, J., McNary, J., Suchard, J., Boysen-Osborn, M., Cierpich, H., Styles, L. and Shusterman, D. (2013), Fatalities due to dichloromethane in paint strippers: A continuing problem. *Am. J. Ind. Med.*, 56: 907–910. doi: 10.1002/ajim.22167.
2. CA FACE investigations: Napa State - investigators say psychiatric hospitals need more than alarms. *Cal-OSHA Reporter*, September 7 2012, Vol. 39, No. 34.
3. CA FACE investigations: Death at a church. *Cal-OSHA Reporter*, September 7 2012, Vol. 39, No. 34.
4. CA FACE investigations: Lessons from a horrific chipper incident. *Cal-OSHA Reporter*, November 9 2012, Vol. 39, No. 43.
5. Missing Joe: A Digital Story. *Worksafe annual publication: Dying at work in California*. April 28, 2013.
6. FACE value: Warehouse worker dies after falling through skylight. *National Safety Council's Safety and Health Magazine*, August 2012.
7. FACE value: Worker crushed by forklift. *National Safety Council's Safety and Health Magazine*, November 2012.
8. FACE value: Tree trimmer electrocuted. *National Safety Council's Safety and Health Magazine*, February 2013.
9. "The California FACE Program – Recent Investigations". Orange County Industrial Hygiene Association Meeting, Santa Ana, CA, June 7, 2012.
10. "Creating Compelling Worker Health and Safety Messages Through Digital Storytelling". AIHA/ASSE Joint Symposium, Long Beach, CA, October 17, 2012.
11. "Scaffold Safety for Day Laborers: The Need for Appropriate Training to Prevent Fatalities". American Public Health Association Annual Meeting, San Francisco, CA, October 28, 2012.
12. "Preventing Falls in the Solar Industry". CA FACE solar digital story shown at the APHA film festival, San Francisco, CA (October 30, 2012). **This digital story won the APHA Digital Technology Award.
13. "Creating Compelling Worker Health and Safety Messages through Digital Storytelling: The CA FACE Program". American Public Health Association Annual Meeting, San Francisco, CA, October 31, 2012.
14. "Methylene Chloride: Past, Present and Future". California Industrial Hygiene Council, Los Angeles, December 3, 2012.
15. "Two Brothers Die When Exposed to Hydrogen Sulfide - a California FACE Investigation". CDPH Division of Environmental and Occupational Disease Control, Richmond, CA, February 19, 2013.
16. "Construction Fatalities: Causes, Effects, Lessons Learned, & New Prevention Tools". Statewide Construction Safety Expo Conference, Sacramento, CA, March 26, 2013.

17. "Scaffold Safety for Day Laborers: The Need for Appropriate Training to Prevent Fatalities". CSTE Annual Conference, Pasadena, CA, June 10, 2013.

Potential Outcomes

1. Based on fatality investigations involving a solar installer who fell from an apartment roof, and a roofing supervisor who fell through a skylight, one English and two Spanish language digital stories were produced highlighting CA FACE investigation findings and the importance of fall protection. These videos were disseminated to solar installation and construction employers, trade associations, community-based green job training programs, and community colleges. The e-mail blast announcing the video effort and prevention recommendations was reposted on labor and trade association websites and public health blogs and listservs. The videos are featured as a key training tool for the joint OSHA and NIOSH Fall Prevention Campaign <http://www.osha.gov/stopfalls/>.
2. Based on two fatality investigations involving workers who died when they inhaled toxic amounts of methylene chloride found in paint strippers, a peer-reviewed publication, *Fatalities Due to Dichloromethane in Paint Strippers: A Continuing Problem*; a report, *Dichloromethane (Methylene Chloride) in Paint Strippers: Survey of Retail Stores*; and an alternatives guide, *Choosing Paint Removal Methods: Safety Considerations*, were published on a new website topic page, Preventing Worker Deaths from Methylene Chloride. All were disseminated nationally and featured in the December 2012 issue of our OHB newsletter, *Occupational Health Watch (e-OHW)*. Additionally, a letter was sent to the Consumer Products Safety Commission warning of the potential for acute toxicity due to MeCl inhalation and requesting opening of their case file for this chemical.
3. Presented CA FACE case findings and digital story theory at multiple employer and trade association meetings, and national conferences.

Intermediate Outcomes

1. The largest national tree care industry trade association continues to use our wood chipper digital story, fact sheet, and investigation report as part of the *National Chipper Training Initiative* curricula. This initiative aims to train thousands of tree care professionals nationwide to adopt safer work practices.
2. CA FACE is collaborating with the American Society for Testing and Materials (ASTM) International to help establish a new test method for human impact on commercial skylights. (ASTM WK17797). We are contributing findings from four CA FACE fatality investigations to determine the weight of worker to protect, distance of fall, material/equipment selection, testing protocol, weathering effects, and labeling. FACE staff contributes to monthly committee meetings and work on the standard is ongoing.
3. The California State Building and Construction Trades Council has incorporated both digital stories (solar and skylight) into their state-wide *Train-the-Trainer Fall Prevention Training* curricula, and select CA FACE investigation reports are featured in their *Construction Case Study Prevention Guide*.
4. CA FACE assisted NIOSH and other FACE states on how to create digital stories based on their own fatality investigations.
5. Worker and employer evaluations of the CA FACE digital stories indicate the videos and investigation findings motivate them to use fall protection, increase the number of worker safety trainings, and follow safety protocols.
6. Based on our findings from the CA FACE investigation of the death of a psychiatric technician at a large forensic facility, we have given three presentations to medical and union audiences, and provided technical information in regard to legislative proposals to require workplace violence prevention plans in acute care hospitals.

End Outcomes

Feedback from our stakeholders suggests that our recommendations have contributed to documented reductions in work-related fatalities in the workplace. Our program continues to work with a variety of governmental and non-governmental stakeholders to encourage safe work practices. Data and investigation findings from our program have been used to identify high hazard industries and occupations. We continue to work towards both legislative and non-legislative solutions to improve working conditions, increase worker and employer knowledge of workplace hazards, and to reduce the burden of work-related fatalities in California.

**CALIFORNIA OCCUPATIONAL HEALTH AND SAFETY SURVEILLANCE
PESTICIDE-RELATED ILLNESS
ANNUAL REPORT**

July 1, 2012 - June 30, 2013

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The overall aims of the project are to identify, characterize, and prevent occupational pesticide illness in California by:

- Expanding case ascertainment using multiple data sources
- Performing case-based field investigations and developing prevention strategies
- Collaborating with local and state agencies
- Disseminating results generated from project activities; and
- Evaluating surveillance activities on an ongoing basis.

MAJOR OUTPUTS

Data

1. We identified 4,482 case reports of occupational pesticide illness from January 1, 1998 through June 1, 2013. Of these, we have coded and analyzed 94%. We classified a total of 2,668 cases as definite, probable, or possible.
2. The overall pesticide illness rate is 1.2/100,000 workers. The top 5 industries with the highest rates are farm production and services (25/100,000 workers); food manufacturing (13/100,000); wholesale of nondurable goods (7/100,000); beverage manufacturing (5/100,000); and highway, street, and bridge construction (4/100,000). The top 5 occupations with the highest rates are pest control operators (63/100,000); agricultural field workers (44/100,000); agricultural graders and sorters (26/100,000); chemical processing machine operators (17/100,000); and agricultural supervisors (17/100,000).
3. We expanded our collaboration with CDPH and are sharing data to aid case ascertainment and case classification.

Press, workshops, conferences, and new partnerships

1. We are assisting the Agency for Toxic Substance Disease Registry (ATSDR) in the development of a white paper based on a national [webinar](#) that we helped produce about pesticide exposures in schools.
2. We published an article in the [California Building Owners and Managers Association \(BOMA\) East Bay Fall 2012 newsletter](#) about fumigating buildings safely.
3. We developed a [fact sheet](#) about safer bed bug treatment based on our data and our work providing technical support to a county environmental and public health agency regarding cleanup of misapplied pesticides used to treat for bed bugs. Tweets and Facebook postings were produced to help disseminate this fact sheet.
4. We collaborated with CDPH's Vector-Borne Disease Section (VBDS) on an electronic [Occupational Health Watch](#) (eOHW) newsletter about bed bugs, which included recommendations on safer bed bug control. This eOHW went to 5,770 recipients. We worked with VBDS to include our [fact sheet](#) and [MMWR article](#) about bed bugs and safe pesticide use on their website.
5. We attended and participated in the annual SENSOR-Pesticide Program conference in January 2013. The meeting focused on data quality issues and interstate data standardization.

6. Staff organized and planned the occupational health workshop and occupational health sessions of the 2013 Council of State and Territorial Epidemiologists (CSTE) annual conference held in Pasadena, California.
7. We presented “Work-related asthma, injury, and illness due to swimming pool chemical exposure” at the CSTE Conference. The presentation focused on the adverse health effects of pool chemical exposure and our planned outreach materials that aim to educate pool operators and employees about pool chemical hazards and safer disinfectant use.
8. We initiated an investigation into pesticide illnesses caused by the use of paraformaldehyde to disinfect biological safety cabinets. We are working with the California Department of Pesticide Regulation (CDPR) to determine the regulatory status of this unregistered product and will advocate for tighter restrictions and labeling.
9. We are collaborating with a University of California, San Francisco expert in mobile health, Planned Parenthood, and other Santa Cruz and Monterey County community-based organizations on a pilot project to evaluate whether text messaging is an effective way to emphasize pesticide illness prevention and reporting with area farmworkers.
10. We provided continued technical consultation to Tulare County Environmental Health Services for the decontamination of a home that had been improperly treated for bed bugs, resulting in pesticide illness among members of a family and the hospitalization of one of the children.

Presentations and Publications

1. “Work-related asthma, injury, and illness due to swimming pool chemical exposure” at the Council of State and Territorial Epidemiologists Conference, Pasadena, CA, June 2013.
2. Hudson NL, Kasner EJ, Beckman J, Mehler L, Schwartz A, Higgins S, Bonnar-Prado J, Lackovic M, Mulay P, Mitchell Y, Larios L, Walker R, Waltz J, Moraga-McHaley, Roisman R, Calvert GM. [Characteristics and magnitude of acute pesticide-related illnesses and injuries associated with pyrethrin and pyrethroid exposures—11 states](#), 2000-2008. Am J Ind Med. 2013. DOI10.1002/ajim.22216.
3. O'Malley M, Fong H, Sanchez ME, Roisman R, Nonato Y, Mehler L. [Inhalation of phosphine gas following a fire associated with fumigation of processed pistachio nuts](#). J Agromedicine. 2013; 18(2):151-73
4. Kasner EJ, Keralis JM, Mehler L, Beckman J, Bonnar-Prado J, Lee SJ, Diebolt-Brown B, Mulay P, Lackovic M, Waltz J, Schwartz A, Mitchell Y, Moraga-McHaley S, Roisman R, Gergely R, Calvert GM. [Gender differences in acute pesticide-related illnesses and injuries among farmworkers in the United States](#), 1998-2007. Am J Ind Med. 2012; 55:571-583

MAJOR OUTCOMES

Potential Outcomes

1. Agricultural workers

Our work that contributed to the gender differences in acute pesticide-related illness and injuries among farmworkers paper illustrated that farmworkers have a high risk for acute pesticide-related illness and injury, and the rate among female farmworkers is approximately twice as high as that among male farmworkers. The paper also showed that female farmworkers who do not handle pesticides were more likely to be working on fruit and nut crops, to be exposed to off-target pesticide drift, and to be exposed to fungicides and fumigants compared to males. The paper reinforces the fact that agricultural workers must be protected from pesticide exposure, especially because they do not have much control over the factors that contribute to their exposure. The paper was also used to emphasize the point that greater efforts, such as stronger protections from drift, improved compliance with pesticide regulations, and integrated pest management, are needed to protect farmworkers from pesticide exposure.

2. Swimming Pool Chemical Illness

Our recent presentation made at the CSTE conference this year, “Work-related asthma, injury, and illness due to swimming pool chemical exposure,” summarizes findings from a two-year collaboration with the Work-Related Asthma Prevention Program, also a part of the Occupational Health Branch. We plan to use our knowledge to comment on the CDC’s Model Aquatic Health Code and to develop educational materials and a web topic page to promote the safer use of pool chemicals. Previous contacts with pool operator associations will be used to help disseminate our materials as will CDPH’s Twitter feed and Facebook page. We have also discussed the development of online training for pool operators with pool operator association representatives and this will be further explored.

Intermediate Outcomes

1. Pesticides in public transit

We initiated an investigation into pesticide illnesses attributed to the use of pesticides on public transit buses and plan to collaborate with other state and local agencies to understand the challenges and hazards of pest control in public transit, to promote the use of integrated pest management (IPM), and to encourage the elimination of spraying on buses. Relationships with other state and local agencies developed through prior collaborations around indoor pesticide use will be leveraged to help in the development of model policies, fact sheets, and/or alerts.

2. Indoor pesticide treatment

Our data and that of other states, as outlined in the recently published paper on pyrethrin and pyrethroid exposures, reinforces our prior emphasis on the prevention of indoor pesticide exposures. We continue to enhance our [web topic page](#) that is dedicated to preventing worker illness from indoor pesticide exposure. This topic page houses our fact sheets and links to resources. New products included on this webpage are a FAQ about IPM and our new fact sheet about safer bed bug treatment. We will continue to use our data to inform or direct our field investigations which will in turn provide new information about the root causes of pesticide illness and prevention strategies.

3. Worker Right to Know

Based on prior collaborative work with CDPR and California Occupational Safety and Health Administration (Cal/OSHA) to clarify that the Hazard Communication Standard and Injury and Illness Prevention Program Standard applies to bystander employees whose workplaces are treated with pesticides, we continue to incorporate information about these two standards in our educational materials, and will work to ensure that employers understand workers’ right to know about potential pesticide exposures in all work settings, and will promote adequate training and education of workers.

End Outcomes

Feedback from stakeholders suggests that our findings, results, and recommendations have contributed to reductions in work-related morbidity, mortality, and exposure related to pesticide use in the workplace. Our program continues to work with a variety of governmental and non-governmental stakeholders to encourage the elimination of the most toxic pesticides and the substitution of less-toxic pesticides and other non-chemical pest-control treatments. Data from our program has been used to help describe pesticide-related illness in California and has been used, alongside analogous data from other states, to demonstrate the extent of pesticide-related illnesses in certain populations (e.g. farmworkers, women) and associated with certain pesticide uses (e.g. swimming pool disinfection) and causative factors that should be changed in order to reduce illness. We continue to work towards both legislative and non-legislative solutions to improve working conditions, increase worker and employer knowledge of pesticide-related health effects, and to reduce the burden of pesticide-related illnesses in California.

**CALIFORNIA OCCUPATIONAL HEALTH AND SAFETY SURVEILLANCE
CARPAL TUNNEL SYNDROME
ANNUAL REPORT**

July 1, 2012 - June 30, 2013

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The overall aims of the Carpal Tunnel Syndrome (CTS) project are to identify, characterize, and prevent work-related CTS in California by:

- Reestablishing and enhancing our previous surveillance system for CTS;
- Utilizing surveillance data to perform selected case follow-up and workplace interventions with prevention recommendations for employers and employees;
- Collaborating with local and state agencies and a wide range of other partners to track CTS in the workplace and implement prevention strategies;
- Disseminating our surveillance data, findings of case investigations, and intervention results
- Evaluating the results of surveillance, field investigations, and information dissemination.

MAJOR OUTPUTS

Data

1. Continued our analysis of workers' compensation data that can be used for efficient and timely targeting of occupations and industries for intervention and prevention activities.
2. Extracted 68,496 claims from the 2006-2011 Workers' Compensation Information System (WCIS) datasets and developed a series of procedures that will allow us to assign a Census Industry Code (CIC) to 95% of these cases, and potentially use the NIOSH Industry and Occupation Computerized Coding System (NIOCCS) to assign Census Occupation Codes (COC). With industry and/or occupation codes assigned to cases, we will be able to calculate industry and occupation specific rates of CTS. These rates will be used to focus our public health education and ergonomic intervention outreach activities.
3. For the years 2006-2011, we identified the ten leading occupations with CTS and reviewed this data to determine whether (1) there is evidence in the medical or scientific literature of ergonomic interventions for these occupations that can reduce the risk of MSDs; (2) information is already widely available to employers and employees about how to reduce the risk of MSDs; and (3) targeted ergonomic interventions are feasible and have an opportunity for collaboration.
4. We selected cake decorators, nurses, legal assistants and dental hygienists for ergonomic evaluation and interventions.
5. In order to prioritize employers for worksite evaluations, we identified California establishments with two or more claims of CTS among employees with the same job title within any 12-month period between 2006 and 2011.
6. Gathered a case definition team for musculoskeletal disorders consisting of two occupational health physicians, a public health nurse, an epidemiologist, and a data analyst who reviewed work-related musculoskeletal disorder case definitions from several sources and decided to use the NIOSH MSD definition
7. Ascertained cases of MSD from WCIS using three steps:
 - Several injury classifications were excluded *a priori* based on their inability to be MSDs. For example any injury caused by burn, cold exposure, or motor vehicle was excluded; any injury with a nature of poisoning, cancer, contagious disease, dermatitis, poisoning, or laceration was excluded; and any injury affecting the head was excluded.

- Text description of the injury and medical billing data of a set of cases for each injury classification were reviewed to determine if different parts of body, nature of injury, or causes of injury should be included in the case definition. We set a 90% threshold for including each part of body, nature of injury, and cause of injury classification, and reached a consensus about each case we viewed. Through this process, we excluded injuries caused by being caught in or between an object; caused by a cut, puncture, scrape, or caused by a fall or slip. This process produced the list of acceptable injury classifications.
 - Finally, we decided on the relationship between the three injury classification fields. While it is theoretically possible that a claim that matches only an acceptable cause of injury or nature of injury should be satisfactory to include it as a case, previous experience and examination of the data let us to believe that a combination of all three fields is necessary for a valid case definition. We examined three sets of potential cases: 1) claims with an acceptable nature of injury, cause of injury and part of body, 2) claims with an acceptable cause of injury and either nature of injury or part of body, and 3) claims with an acceptable part of body and either cause of injury or nature of injury. We decided that the more restrictive definition of claims that matched on all three classifications was preferable.
8. Further work has determined that expanding the definition to include claims identified from a list of acceptable ICD9 diagnosis codes that match either one of two causes, repetitive motion or strain from lifting, or one of three natures, carpal tunnel syndrome, VDT-related diseases, and hernia, deserve to be included as work related MSD cases. These cases are an increase in approximately 1,000 claims a year that would not otherwise have been captured.
 9. Identified 1.26 million MSD claims between 2006-2011 (148/10,000); and 10,532 MSDs among hotel housekeepers (156/10,000).

Partnerships

1. Collaborated extensively with the UC Berkeley Ergonomic Program (David Rempel, MD) to develop a selection of industries and occupations that would most benefit from ergonomic education programs designed to prevent CTS. Dr. Rempel and his team have also worked with us to design a series of short instructional videos aimed at preventing CTS among dental hygienists,
2. Collaborated with the San Francisco Dental Hygienist Ergonomic Advisory Board to fine tune the scripts and story boards of five educational videos we are producing that aim to educate dental hygienists about CTS, MSDs, and how to prevent work-related injuries.
3. Contacted California Dental Hygienists Association (CDHA) about offering continuing education credits for ergonomic training.
4. Attended California Safety and Health Standards Board meetings about an ergonomic standard for the hotel industry, and shared data with the Standards Board about MSDs in hotel housekeepers

Presentations

1. Cohen, R et al: "Evaluation of a workers' compensation electronic database for tracking work-related musculoskeletal disorders (MSDs) among hotel housekeepers—California, 2006-2009." CSTE Annual Conference, June 2013.

MAJOR OUTCOMES

Potential Outcomes

1. Completed a major report of CTS surveillance findings in California, and presented summary of results to BLS, NIOSH and State research partners in July 2012.
2. Demonstrated feasibility and utility of using workers' compensation data to enumerate cases of CTS in California.
3. Identified employers with multiple cases of CTS that may benefit from public health education and intervention efforts to implement an effective ergonomic program.

4. Offer continuing education (CE) credits for ergonomic training for dental hygienists.

Intermediate Outcomes

1. Developed scripts and storyboards for a series of five educational videos. The purpose of the video series is to educate dental hygienists about the risks of CTS, MSDs, and the steps that can be taken to prevent CTS and MSDs. The video topics include: an overview of CTS and MSDs, proper patient positioning, the importance of selecting and using the correct dental instrument for the task at hand, the use of loupes, and creating a work schedule that prevents workers from doing high risk activities for extended time periods. An experienced filmmaker will be hired to shoot in the Fall of 2013.

End Outcomes

An ongoing multisource surveillance system for CTS in California has the potential to identify high-risk occupations and industries that can implement effective ergonomic programs to reduce the known risk factors for work-related musculoskeletal disorders (MSDs). In 2011, California enacted a standard for Safe Patient Handling in acute care hospitals that may significantly lower the rate of MSDs. The methods for CTS surveillance can be applied to tracking the incidence of other MSDs such as back injuries that occur to healthcare personnel in these settings. Likewise, in 2012 the California Safety and Health Standards Board will consider a new standard to reduce MSDs among hotel housekeepers. The surveillance methods and systems for tracking CTS cases are currently being used to evaluate the risk of MSDs among this population, and to inform the rulemaking process. The ongoing analysis of surveillance data on the risk of CTS and other MSDs in selected occupations and industries can lead to public health and regulatory interventions that reduce the medical and other costs associated with these disorders.